
Space Weather Forecast

Issued on Monday 21 October 2024 at 13:29 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Minor geomagnetic storms (G1) day 1 and 2 (21 and 22 Oct). Increasing chance of Radio Blackouts this week.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low. There are eleven sunspot regions on the disc. Despite the large number of sunspots present, most are small with limited magnetic complexity and only slowly evolved. Two new minor regions were numbered in the eastern hemisphere.

The largest Common-class flare of the period was observed from a region just beyond the eastern limb.

There has been a data outage of the SOHO observing system since 20/1412Z and only very limited solar imagery has been available since then. Other solar imagery has been available during the period, but does not indicate any Earth-directed Coronal Mass Ejections (CMEs).

Solar Wind / Geomagnetic Activity: Solar winds speeds declined steadily from a peak of 400km/s to around 350km/s by the end of the period. The Interplanetary Magnetic Field, Bt, strength was Weak throughout with the important north-south component, Bz, also varying Weakly. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low, with a chance of Moderate activity from isolated Moderate-class flares initially. Activity likely increasing through the period with the return of several notable sunspot regions over the eastern limb, probably becoming Moderate by day 3 (23 Oct), with a slight chance of becoming High, given an increasing probability of isolated Strong flares occurring.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs in the forecast. Solar winds are currently at Background levels, however a connection to the fast wind from a recurrent coronal hole is expected either from very late on day 1 (21 Oct), or more likely during day 2 (22 Oct). Consequently, solar winds should increase to between Slightly Elevated and Elevated levels. This enhancement is likely to bring Active intervals with a high Chance of peak Minor geomagnetic storm (G1) conditions, before activity declines to Quiet to Unsettled levels through days 3 and 4 (23 and 24 Oct).

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Energetic Particles / Solar Radiation: Solar radiation storms are not expected.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	10	50	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	No	40	50	60	60
Very Active	R3-R5 (X Class)	No	5	5	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						